

## Critical Thinking and Problem Solving in Advanced Manufacturing Lesson Plan

### Problem-Solving Guidelines Handout

Here's an example of a common problem-solving process that you can use to think about the scenarios in this lesson:

#### 1. Identify and Define the Problem

- Develop a problem statement. Include an evaluation of the present state and how it differs from the goal state. Be sure you have evidence to support your views.
- Ensure the group is working toward the same goal.

#### 2. Analyze the Problem

- Learn as much as you can about the problem. Seek other perspectives (ask questions!), and get help if you lack sufficient information.
- Outline step by step what needs to be solved.

#### 3. Identify Possible Solutions

- Come up with as many solutions as possible, including ones for similar problems in the past.
- Be creative and brainstorm as a group (anything goes!), and record all ideas so the whole group can see them.

#### 4. Select the Best Solutions

- Choose the solutions that best address the problem and could help you determine its root cause.
- Be sure to consider the resources (such as people, time, and other expenses) needed for each solution to work.

#### 5. Evaluate the Best Solutions

- Weigh the advantages and disadvantages of each solution. Do they meet immediate and long-term goals? Are there any risks associated with them?
- Are the solutions practical? Exactly how and when could you implement them?
- Do the solutions address the root cause of the problem?

#### 6. Develop an Action Plan

- Divide the solutions into sequential tasks that you can later implement.